

ABSTRACT OF THE DISCLOSURE

[65] Speculative prefetching during DMA reads in a message-passing, queue-oriented bus system is controlled by creating a special data structure, called a “DMA scoreboard”, for each work queue entry associated with a DMA read. The DMA scoreboard tracks the completion of DMA writes and reads by monitoring acknowledgements received from DMA writes and data tags received from DMA read responses. The DMA scoreboard also contains a section that indicates the current PCI address, and size and number of prefetches to be performed. After a DMA read has completed, the PCI current address is incremented to obtain a new PCI address for the first prefetch request. A new work queue entry is then created from the information in the DMA scoreboard to perform the prefetch. If the amount of data to be fetched exceeds the maximum amount of data that can be retrieved by a single read request, when the read request has been completed, the address stored in the DMA scoreboard is again incremented to create another address and another work queue entry is created. Operation continues in this manner until the number of prefetches specified in the DMA scoreboard have been performed.